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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/664,002

09/16/2003

Ichiro Uchizaki

3909

26021 7590 11/23/2005

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EXAMINER

GOLUB, MARCIA A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/664,002

Applicant(s)

UCHIZAKI ET AL.

Examiner

Marcia A. Golub

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/340,349.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Continuation Application transmitted

DETAILED ACTION

Claim Objections

Claims 1-13 are objected to because of the following informalities: Since the term "second cladding layer" has been amended in the specification to mean either "second cladding layer" or "third cladding layer" the claim language should also be changed accordingly. Appropriate correction is required.

Response to Arguments

Applicant's arguments, see page 15 filed on 11/08/2005, with respect to a double patenting rejection have been fully considered but they are not persuasive.

The applicant is reminded that only a timely filed ***divisional*** application is not subject to a double patenting rejection (35 U.S.C. § 121). The applicant however filed a ***continuation*** application as evidenced by the transmittal letter filed by the applicant on 9/16/2003 and a copy of which is attached to this office action. The double patenting rejection is therefore valid.

Applicant's arguments, see pages 11-14, filed on 11/08/2005, with respect to the rejection(s) of claim(s) 1-13 under 102(b) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bour et al (U.S. Pat. 5,982,799).

Double Patenting

The text of the double patenting rejection not included in this action can be found in a prior Office action.

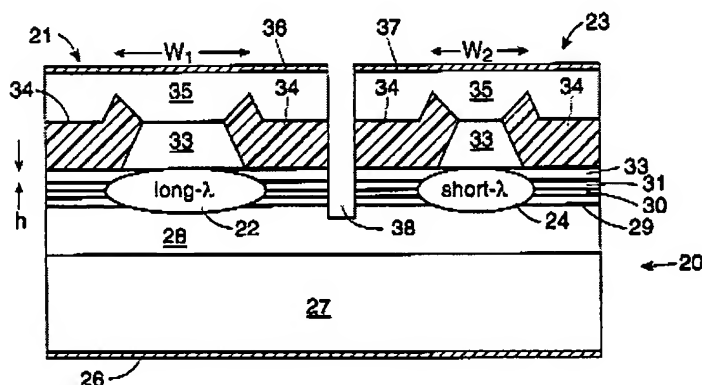
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 3-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Bour et al (U.S. Pat. 5,982,799).



Regarding **Claims 1, 3-6**, Fig 4 of Bour discloses: "A semiconductor laser array comprising:

a GaAs substrate; [27]

a first laser element portion [21] provided on said substrate to release laser light of a first wavelength;

a second laser element portion [23] provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength, (3/66-67, 4/1-2)

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said first laser element portion including a first cladding layer [28], an active layer [30] formed by epitaxially growing a first semiconductor material on said first cladding layer, a second cladding layer [33] formed on said active layer and a current-blocking layer [34] to confine an electrical current injected into said first laser element portion,

said second laser element portion including a first cladding layer [28], an active layer [30] formed by epitaxially growing a second semiconductor material on said first cladding layer, a second cladding layer [33] formed on said active layer and a current-blocking layer [34] to confine an electrical current injected into said second laser element portion,

said current-blocking layer[34] of said first laser element portion and said current-blocking layer of said second laser element portion are made of same semiconductor material. [GaAs]

wherein group-V species included in said second cladding layer of said first laser element portion is not identical to group-v species included in said current-blocking layer of said first laser element portion,

and group-V species included in said second cladding layer of said second laser element portion is not identical to group-V species included in said current- blocking layer of said second laser element portion."

Bour specifies the second cladding layer of first and second lasers to be made of InAlGaP, and the current blocking layer of the first and second lasers made of GaAs. Both P and As come from group-V of the periodic table.

"wherein said second cladding layers [33] of said first and second laser element portions are made of InGaIP,

wherein said second cladding layer [33] of said second laser element portion [23] is configured as a ridge stripe extending along laser cavity lengthwise directions and both sides of said ridge stripe is buried by said current-blocking layer [34]."

Wherein said first wavelength ranges about 780 nm as it's center, and said second wavelength ranges about one of 635 nm, 650 nm, 685 nm as it's center" (page 2 line 38)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 7 - 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bour as applied to claims 1, and 3-6 above and further in view of Ishihara (U.S.Pat. 5,978,404).

Regarding **claim 2** Bour discloses the semiconductor laser array as disclosed above:

"wherein said first and second cladding layers of said second laser element portions are made of $\text{InGa}_{1-x}\text{Al}_x\text{P}$ ($0 < x \leq 1$)" (4/17 and 4/20)

but does not specify that "first and second cladding layers of said first laser element portions are made of AlGaAs" However, however is well known in the art and is

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disclosed by Ishihara to use AlGaAs as a layer of a laser so that the output wavelength ranges about 780 nm. (1/23-25)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ishihara into the device disclosed by Bour by making cladding layers of the first laser that includes an AlGaAs. The ordinary artisan would have been motivated to modify the device of Bour in the manner set forth above for at least the purpose of creating a laser array that could be used in CD/DVD drive.

Regarding **claims 7 and 8** Bour discloses the semiconductor laser array as disclosed above:

“wherein said active layer of said second laser element portion includes an $\text{In}(\text{Ga}_{1-y}\text{Al}_y)\text{P}$ ($0 \leq y \leq 0.2$) layer and said second wavelength ranges about one of 635 nm, 650 nm, 685 nm as it's center” Bour specifies the active layer to be made of AlGaInP and the wavelength ranging about 650 nm. (4/19 and 4/39)

Bour does not disclose that “the active layer of said first laser element portion includes an AlGaAs layer wherein said first wavelength ranges about 780 nm as it's center”, however is well known in the art and is disclosed by Ishihara to use AlGaAs as a layer of a laser so that the output wavelength ranges about 780 nm. (1/23-25)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ishihara into the device disclosed by Bour by making active layer of the first laser that includes an AlGaAs layer. The ordinary artisan would have been motivated to modify the device of Bour in the manner

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set forth above for at least the purpose of creating a laser array that could be used in CD/DVD drive.

Regarding **claim 9** Bour and Ishihara disclose the semiconductor laser array as disclosed above:

but does not specify that “active layer of said first laser element portion has a bulk structure and said active layer of said second laser element portion has a multiple-quantum well structure.” Bour specifies using QW structure in the active layer of the laser. (4/34) Single and multiple quantum wells layers as well as bulk layers are well known in the art and used in the active regions of lasers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make active layer of the first laser with a bulk structure, and the active layer of the second laser with a MQW structure. The ordinary artisan would have been motivated to modify the device of Bour and Ishihara in the manner set forth above for at least the purpose of creating a laser array where each laser is lasing at a different wavelength and such that the threshold current of one of the lasers (MQW active region) is lower than the threshold current of the other laser (bulk active region).

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bour and further in view of Valster et al (EP 634,823).

Regarding **Claim 10**, Fig 4 of Bour discloses:

“a GaAs substrate; [27]

a first laser element portion [21] provided on said substrate to release laser light of a first wavelength;

a second laser element portion [23] provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength", (3/66-67, 4/1-2)

"said first laser element portion including a first cladding layer [28] made of InGaAlP, an active layer [30] formed on said first cladding layer, a second cladding layer [33] formed on said active layer and made of InGaAlP, and top layer [35] formed to cover said second cladding layer"

"said second laser element portion including a first cladding layer [28] made of InGaAlP, an active layer [30] formed on said first cladding layer, a second cladding layer [33] formed on said active layer and made of InGaAlP, and top layer [35] formed to cover said second cladding layer"

Bour does not disclose a striped shaped intermediate layer positioned between the second cladding layer and top layer in both lasers. However, intermediate layer is well known in the art of semiconductor technology and is evidenced by Valster. Fig 1 of Valster discloses "a stripe-shaped intermediate layer [5] formed on said second cladding layer and made of a semiconductor material having a smaller band gap than said second cladding layer, and top layer formed to cover said second cladding layer and said intermediate layer and made of a semiconductor material having a smaller band gap than said intermediate layer." Table 1 of Valster specifies that the second cladding layer has a band-gap $E_G=2.2$ eV, intermediate layer has $E_G=1.9$ eV, and top

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layer has $E_G=1.4$ eV. The band-gap values are in correct order $2.2>1.9>1.4$, and therefore meet the limitation of the claim.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the invention of Valster into the device of Bour by integrating an intermediate layer between the second cladding layer and the top layer. The ordinary artisan would have been motivated to modify Baur in the manner set forth above for at least the purpose of reducing the lattice mismatch between the layers.

Regarding **Claim 11**, Bour and Valster disclose the semiconductor laser array as disclosed above (Fig 4 of Bour):

“wherein said second cladding layer [33] of said second laser element portion [23] is configured as a ridge stripe extending along laser cavity lengthwise directions and both sides of said ridge stripe is buried by said current-blocking layer [14].”

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bour and Valster as applied to claim 10 above and further in view of Ishihara (U.S.Pat. 5,978,404).

Regarding **claims 12 and 13** Bour and Valster disclose the semiconductor laser array as disclosed above:

“wherein said active layer of said second laser element portion includes an $\text{In}(\text{Ga}_{1-y}\text{Al}_y)\text{P}$ ($0 \leq y \leq 0.2$) layer and said second wavelength ranges about one of 635 nm, 650 nm, 685 nm as it's center” Bour specifies the active layer to be made of AlGaInP and the wavelength ranging about 650 nm. (4/19 and 4/39)

Bour does not disclose that "the active layer of said first laser element portion includes an AlGaAs layer wherein said first wavelength ranges about 780 nm as it's center", however is well known in the art and is disclosed by Ishihara to use AlGaAs as a layer of a laser so that the output wavelength ranges about 780 nm. (1/23-25)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ishihara into the device disclosed by Bour and Valster by making active layer of the first laser that includes an AlGaAs layer. The ordinary artisan would have been motivated to modify the device of Bour in the manner set forth above for at least the purpose of creating a laser array that could be used in CD/DVD drive.

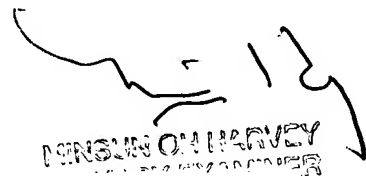
Fax/Telephone Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcia A. Golub whose telephone number is 571-272-8602. The examiner can normally be reached on M-F 9-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAG



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